

UNDERSTANDING THE GLOBAL MARKETPLACE – A UK PERSPECTIVE

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Within the UK context, I will share the experiences of the Department for Continuing Education at the University of Oxford in developing short professional-updating courses and part-time modular MSc programmes in the sciences, engineering and technology. The Department for Continuing Education offers these professionally-oriented programmes, whether non-credit-bearing, credit-bearing or award-bearing, via its Continuing Professional Development Centre. The Continuing Professional Development Centre offers approximately 180 different course options on an annual basis and caters to the needs of about 1500 individual students through a mixture of face-to-face, online and hybrid (a blend of face-to-face and online) delivery.

1. Introduction

Gone are the days when engineering contracts were plentiful on a local or national scale; globalization is resulting in a 'smaller' and more competitive world of integrated economic, cultural, political, religious, and social systems, with countries such as China, and India and others able to promise cheaper prices and comparable quality. The 'global marketplace' is difficult to define precisely, but can be thought of as a borderless, multinational place where goods and services are exchanged – certainly, it is leading to a new global economy driven primarily by the growth in science and technological knowledge. For example, changes in the global economy are clear when one considers that there is now an approximately equal number of new cars sold in China as in the US; approximately half the multinational companies on today's Fortune 500 list have been established within the last 30 years; and the US graduates approximately 50,000 engineers per year (the UK just a fraction of this number), India about 300,000 and China about 500,000.

Continuing education has an important role to play in this new world, where we need a knowledge society with business recognizing the value of a workforce that keeps its skills up to date, while acknowledging global differences, similarities and opportunities. E-learning is one obvious route to the global marketplace, but this requires an understanding of differences in: pedagogical requirements and usage patterns; responses to marketing and brand recognition; the competitive landscape; cultural interactions and responses; national accreditation requirements; conceptual acceptance of e-learning and e-assessment; and administrative procedures.

The UK, with the demise of its once healthy manufacturing industry, has refocused itself on service industries and on the high-end innovation, intellectual-property generation and specialized technological research and development. Oxford's Continuing Professional Development Centre is well placed within the UK's leading research-intensive university to provide continuing learning options essential for these specialisms and has positioned itself as a global player in the continuing education marketplace.

2. The UK Landscape

In 2004, the UK Government commissioned Sandy Leitch to undertake an independent review of the UK's long-term skills needs – 'Prosperity for all in the global economy – world class skills' [1]. The Review identified the UK's optimal skills mix for 2020 to maximize economic growth, productivity and social justice, set out the balance of responsibility for achieving that skills profile and considered the policy framework required to support it. The Leitch Review shows that the UK must urgently raise achievements at all levels of skills and recommends that it commit to becoming a world leader in skills by 2020 by doubling attainment at most skill levels. Responsibility for achieving ambitions must clearly be shared between Government, employers, educational institutions and individuals.

The UK's Russell Group¹ of universities provided evidence to the Select Committee's Inquiry recently into the 'Future Sustainability of the Higher Education Sector' [2], focusing on the contributions these research-intensive universities make to the UK's international competitiveness through teaching and research and provision for high-level skills; the importance placed on fair access; and valuable work with industry and commerce. The Russell Group submission noted that the acquisition of skills is essential in a 21st Century economy, and, furthermore, for sustainability it is high-level and leading-edge skills that are most essential, particularly in science, engineering and technology.

This Group of UK universities: trains the brightest students from home and abroad; already trains three-quarters of the nation's doctors and dentists; provides over half by value of all the UK's university-based private- and public-funded R&D; is at the forefront of business spin outs and IPR licensing; and consequently the Group has a continuing responsibility lead in the training and continuing lifelong education of the entrepreneurial, science, engineering and technology talent of the future.

A recent survey of 'Public Attitudes to, and Perceptions of, Engineering and Engineers' [3] showed that the awareness and knowledge in the UK of engineering are still limited (though varying with factors such as social class, education, gender and age). Perhaps surprisingly, a more sophisticated understanding of engineering tended to reside with older respondents. Recognition of limited public understanding has led to the initiation of a concerted campaign to engage with the public, underpinning the vision for the future of the UK's high-level skills base in science, engineering and technology. The UK's support of engineering-related public engagement is exemplified by the scheme run by the Engineering and Physical Sciences Research Council, which is the UK Government's leading funding agency for research and training in engineering and the physical sciences. This public-engagement scheme is designed to enable active researchers to engage with the public, including young people, with objectives [4] to:

- Stimulate the public's interest in contemporary research.
- Inspire future generations of researchers in engineering and the physical sciences.
- Encourage public debate about the role of research in society and establish a dialogue between researchers and the public.
- Build and sustain a community of researchers active in public engagement, including through partnerships, with the necessary expertise.

¹ Universities of Birmingham, Bristol, Cambridge, Cardiff, Edinburgh, Glasgow, Imperial, King's College London, LSE, Leeds, Liverpool, Manchester, Newcastle, Nottingham, Oxford, Queen's University Belfast, Sheffield, Southampton, University College London and Warwick.

- Build projects that not only increase the public's awareness of science and engineering, but also include some level of dialogue between members of the public and scientists or engineers, where this is appropriate.

Oxford's Continuing Professional Development Centre is active both in public engagement and high-quality professional-development provision for part-time students, bringing a distinct body of able students into contact with Oxford University and extending the University's reputation regionally, nationally and internationally.

3. The Oxford Perspective

The need for educational opportunities that extend throughout life is now recognized in all sectors of modern society: an intensive period of initial education, even of the highest quality, is simply not sufficient in times of rapid social, economic and technical change. Oxford was one of the first universities to respond to this need and, primarily through the work of the Department for Continuing Education, is now recognized internationally as a leading provider of opportunities for extended learning for purposes of continuing professional and personal development.

Since its inception in 1988, the Continuing Professional Development Centre has been developing training resources and innovative courses at postgraduate level to meet the changing needs of a wide range of professional practitioners. As one of three divisions of the Oxford University Department for Continuing Education, the Continuing Professional Development Centre has been able to draw on over 100 years' experience of providing high-quality, flexible, part-time education specifically tailored for adults and complementing the work of the University in full-time education.

The Continuing Professional Development Centre now has approximately 180 course options (predominately in the sciences) and 1,500 individual students per year; see appendix for the range of courses. The Continuing Professional Development Centre's capabilities have developed from its extensive experience of creating learning solutions for a diverse and professionally demanding clientele. Current capabilities include, but are not restricted to:

- Commissioned Master's-level course production and delivery, often in multidisciplinary and interdisciplinary fields.
- Agile and responsive short-course, in-company, face-to-face, online and hybrid course production and delivery.
- Securing University accreditation for credit-bearing and award-bearing courses, and maintaining the quality of academic provision via periodic internal and external reviews.
- Securing and maintaining professional-body accreditation.
- Identification and analysis of market demand and of emerging interdisciplinary areas.
- Detailed learning and training needs analysis.
- Pedagogical research and consultancy.
- Development of professional-development courses and dissemination resources as part of major, often interdisciplinary, research proposals.
- Provision of a gateway to University contacts and facilities.

The Continuing Professional Development Centre, with its interactions across the University, is well placed within the University not only to fulfil the University's strategic objectives in terms

of personal- and professional-development part-time course provision, but also in wider areas of knowledge transfer by:

- Enhancing the University's programme of enterprise, innovation and knowledge transfer and professional development to ensure that Oxford remains one of the most entrepreneurial universities in the world.
- Working with other outward-facing parts of the University to support the already significant contributions locally, nationally and internationally, that the University makes via its various forms of lifelong learning, public engagement and professional development.
- Helping government to achieve its mission.²
- Leveraging sources of third-stream funding³ to support existing knowledge-transfer activities and to develop new initiatives to maximize Oxford's dissemination of its teaching particularly to the developing world, and its research findings particularly to the public, to private, public and third sectors, and to government.

As part of a flexible fit-for-purpose package of professional-development provision, the Continuing Professional Development Centre also sees a growing role for online and hybrid (face-to-face and online) courses, interactive online communities of practice for sharing of information and informal learning, and for non-accredited courses of professional updating. Our work also has an important role to play in maintaining lifelong relations with the University's alumni.

The Continuing Professional Development Centre's strategy is to align itself with the University's, regional, national and international priorities and to build on its existing partnerships and to raise awareness of its continuing readiness to develop and deliver research-led postgraduate programmes jointly with other parts of the University and with external bodies. Frameworks such as these that enable earlier interaction between researchers and industry, support inter- and multidisciplinary collaborations, and provide a greater understanding of entrepreneurial skills required for the global marketplace are crucial.

4. Conclusions

The pace of change in the last decades of the last century into the 21st century, with globalization, innovations in technology, the spread of knowledge and technical skills, has significantly accelerated, setting continuing educationalist challenges. These challenges must be confronted requiring organizational and educational transformation – human resource must become recognized as an asset rather than simply a drain on financial resources – with

² For example DIUS, Department for Innovation, Universities and Skills, has the following stated objectives [5]:

- Improve the skills of the population throughout their working lives to create a workforce capable of sustaining economic competitiveness, and enable individuals to thrive in the global economy.
- Pursue global excellence in research and knowledge, promote the benefits of science in society, and deliver science, technology, engineering and mathematics skills in line with employer demand.
- Strengthen the capacity, quality and reputation of the Further and Higher Education systems and institutions to support national economic and social needs.
- Encourage better use of science in Government, foster public service innovation, and support other Government objectives which depend on the DIUS expertise and remit.

³ Aligned with the recommendations of Lord Sainsbury of Turville's: The Race to the Top [6] to coordinate research council and HEFCE knowledge-transfer priorities and funding.

organizations investing not only in research and development, but also in education and human resource development.

A lack of investment in raising the skills of the workforce not only risks reducing the competitiveness of the UK's business and economy, but also widening divisions within civil society. Government, educational institutions, business and individuals must, therefore, be prepared to work in partnership to ensure that the UK has the world-class skills base needed to remain a global economic force – postgraduate technology-based continuing education is a vital element.

5. References

1. Leitch Review of Skills: Prosperity for all in the global economy – world class skills (December 2006).
2. Russell Group response to the Education and Skills Committee inquiry into future sustainability of the Higher Education sector (December 2006).
3. The Engineering and Technology Board and The Royal Academy of Engineering's survey of Public Attitudes to, and Perceptions of, Engineering and Engineers (2007).
4. <http://www.epsrc.ac.uk>.
5. <http://www.dius.gov.uk/mission.html>.
6. Lord Sainsbury of Turville's: The Race to the Top. A Review of the Government's Science and Innovation Policies (October 2007).

Appendix

The Continuing Professional Development Centre has part-time postgraduate professional programmes of study and short courses in:

- **Bioinformatics** (stand-alone modules, a postgraduate certificate, a postgraduate diploma, and an MSc: joint with the Department of Statistics).
- **Biosciences** (short courses).
- **Business and Scientific Skills** (short courses).
- **Cognitive Therapy** (stand-alone modules, two postgraduate diplomas, an MSc and an MSt: in conjunction with the Department of Psychiatry and the Oxfordshire & Buckinghamshire NHS Mental Healthcare Trust).
- **Environment and Sustainability** (short courses).
- **Environmental Conservation** (stand-alone modules and a postgraduate certificate in development and an undergraduate diploma and advanced diploma).
- **Evidence-Based Health Care** (stand-alone modules, a postgraduate certificate, a postgraduate diploma, an MSc and DPhil: joint with the Department of Public Health and Primary Health Care).
- **Experimental Therapeutics** (stand-alone modules and an MSc: joint with the Department of Clinical Pharmacology).
- **Mathematical Finance** (stand-alone modules, a postgraduate diploma and an MSc: joint with the Mathematics Institute).
- **Nanotechnology** (stand-alone modules, an online postgraduate certificate and an MSc: in conjunction with the Oxford University Begbroke Science Park and in collaboration with other University departments).
- **Organizational Learning-Needs Analysis** (short courses).
- **Paediatric Infectious Diseases** (stand-alone modules and a hybrid postgraduate diploma: in conjunction with the Department of Paediatrics).
- **Provision of Health Care to the Homeless** (stand-alone modules and a hybrid postgraduate certificate).
- **Public Policy Making** (short courses with the National School of Government).
- **Software Engineering** (stand-alone modules, two postgraduate certificates, a postgraduate diploma, an MSc and DPhil: joint with the Computing Laboratory).
- **Software and Systems Security** (stand-alone modules, a postgraduate certificate, a postgraduate diploma, and an MSc: joint with the Computing Laboratory).
- **Technology – Electronics, Telecoms and Engineering** (short courses).

CV: Professor RJ Lingwood, MA, PhD (Cambridge), MA (Oxford), CEng IMechE

I have been employed as Director of Continuing Professional Development (CPD) since 2005. The Department's primary purpose is to provide substantial programmes of part-time and other flexible learning and knowledge transfer activities, to complement the work of the University in full-time education. CPD delivers approximately 180 different part-time course options to professional practitioners, including six full Oxford University MSc programmes, over 10 postgraduate award-bearing programmes, and a host of short courses in professional updating. Approximately 15,000 individuals undertake courses with Continuing Education each year and about 1,500 of those are with CPD.

Qualifications

1992: BA (Hons) Engineering, Class 1* distinction: Cambridge University.

1995: MA and PhD Engineering/Applied Mathematics: Cambridge University.

2004: Chartered membership of the Institute of Mechanical Engineers, CEng IMechE

2005: MA: Oxford University.

Appointments:

1995-1997: Maudslay Research Fellowship, Pembroke College, Cambridge.

1997-2000: Royal Society Dorothy Hodgkin Research Fellowship.

1997-2000: Fellow, Pembroke College, Cambridge. Director of Studies (Engineering), Pembroke College, Cambridge.

1999-2000: Chargé de recherche, Laboratoire d'Hydrodynamique, École Polytechnique, France.

2001-2003: Intellectual Property and Research Manager, Opsys Ltd, Oxford.

2003-2005: Aerospace & Automotive Programme Manager, Begbroke Directorate, University of Oxford.

2003-2005: Part-time secondment to the Faraday Advance Partnership in Aerospace and Automotive Materials (now the Materials KTN), University of Oxford.

2003-2005: Oxford University Knowledge Transfer Partnership (KTP) Manager, Oxford University KTP Office, Begbroke Directorate, University of Oxford.

2005: Director, Continuing Professional Development, and Deputy Director, Department for Continuing Education, Oxford University, and Fellow, Kellogg College, Oxford

2007: Visiting Professor, Royal Institute of Technology (KTH), Stockholm, Sweden

Current Subsidiary roles:

- Member of the University's EPSRC Collaborative Training Account (CTA/KTA) Management Committee.
- Continuing Education's representative on the University's Medical Sciences Divisional Educational Policy and Standards Committee.
- Continuing Education's Research Coordinator.

Grants since 2003:

- EPSRC Collaborative Training Account (CTA), £2.3m.
- EPSRC, £60k, SPRINTCar (Short-Production Run INnovative Technology Car) innovative UK demonstrator car - technology evaluation and consultation exercise.
- EPSRC, £60k, DRIVENet (Network for the design for dismantling, reuse & recycling in road vehicles).
- EPSRC, £62.5k, WINGNet (Network for waste reduction in aircraft related groups).
- DTI, £20k, establish a recognized Oxford University Knowledge Transfer Partnership (KTP) Office.
- BBSRC, Modular Training for Industry Scheme:
 - i. £55k, the business of bioremediation;
 - ii. £35k, bioinformatics and software engineering master's-level modules;
 - iii. £50k, experimental therapeutics master's-level modules;
 - iv. £16k, biomedical nanotechnology master's-level module;
 - v. £18k, simulation methods for systems biology master's-level online module.
- Wellcome Trust Interdisciplinary Training Programme in Translational Medicine and Therapeutics, £6.2m, *under consideration*.
- Wellcome Trust Research Capacity Strengthening in Africa, £15.1m, *under consideration*.
- DfID-British Council DelPHE, Dar-Oxford Link for Health: Translating Knowledge into Practice, £90k, *under consideration*.